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Original Research Article

Oral Contraceptive Pill Use and Heart Disease Risk among Premenopausal Women

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Abstract

Introduction: Women's cardiovascular risk is not adequately addressed, particularly during the menopausal transition when the risk of cardiovascular events rises. Women die from cardiovascular disease (CVD) more frequently than any other cause. The study's objective was to evaluate pre-menopausal women's heart disease risk in connection to oral contraceptive tablets. ***Method:*** A comparative observational study was conducted at the department of cardiology, Prime Medical College Hospital, Rangpur, Bangladesh during the period of January 2020 to December 2020. A total of 140 participants were included for the study. Among them 70 women with HD (Heart Disease) were Group I and 70 women without HD (Heart Disease) were Group II. Respectively women were assessed exclusively using a case sheet that include age, full medical history, past medical history (mainly hypertension), family history, smoking history & the use of oral contraceptive pill (OCP) and duration of use. Statistical analyses were done by using SPSS 19.0 for windows Inc. ***Results:*** Mean age was 45.97 ±0.46 women with HD and 44.83 ±0.57 was women without HD. Women with HD age range 50-55 were 82.9 % (58) and 81.4% (57) were women without HD. Overweight & Obese were 66(94.3%) women with HD and 50(71.4%) were women without HD. Dyslipidemia were 69(98.6%) women with HD and 16(22.9%) were women without HD. Hypertension 65(92.8%)were women with HD and 16(22.9%) were women without HD. Use of OCP was higher among women with HD 61(87.1%) as compared with those without HD 29(41.4%). Duration of OCP was significantly longer in women with HD than women without HD. The effect of OCP use in women with Hypertension 40(61.33%) were women with HD and 6 (37.50%)were women without HD. The effect of OCP use in women with Smoking 10 (68.42%)were women with HD and 1 (25%)were women without HD. The effect of OCP use in women with Family history 34 (57.14%)were women with HD and 6 (33.33%)were women without HD. This study has confirmed the aforesaid findings in which the use of OCP increase the risk of HD in premenopausal women specifically in those who already have risk factors of HD. The effect of OCP use in women with Hypertension 51(61.5%) were women with HD and 6 (35.8%) were women without HD. ***Conclusion:*** The risk of heart disease was increased among women who used oral contraceptives. Cardiovascular events can be abridged by the management of risk factors. Mainly significant is the control of hypertension, lipids, and other factors contributing to the metabolic syndrome.

Keywords: Heart Disease, Oral Contraceptive Pills, Premenopausal, Estrogen.

INTRODUCTION

Women's cardiovascular risk is not adequately addressed, particularly during the menopausal transition when the risk of cardiovascular events rises [1]. Cardiovascular disease (CVD) is the main cause of mortality in women. Women's risk for developing CVD increases significantly after menopause, and they often experience coronary heart disease many years later than males do [2]. Due to the ease of the available regimens, cheap cost, and greater acceptance by women compared to alternative non-hormonal contraceptive techniques, the use of oral contraceptive tablets has become extensively distributed in recent decades around the world. By affecting the endocrine system, the oral contraceptive pill prevents ovulation, implantation, and hence pregnancy. Low standards of living caused by insufficient security and socioeconomic conditions

encourage women to use oral contraceptive pills. In addition, the prevalence of HD is rising among women and younger age groups, which draws our interest in researching the association between oral contraceptive use and the risk of HD. In addition to avoiding and carefully managing diabetes, the perimenopausal woman has to address her risk factors for hypertension, dyslipidemia, obesity, and other aspects of the metabolic syndrome. Lowering blood pressure is essential since hypertension is a crucial risk factor [3]. The cardiovascular hazards linked with women using oral contraceptives more often and for longer periods of time must be better understood and reduced immediately. Blood lipid (fat) levels and blood vessel tone and function are both impacted by reproductive hormones. Low estrogen levels have been linked to an increased risk of unfavorable cardiac events, including heart attacks and strokes, as well as coronary atherosclerosis (the thickening and hardening of arterial walls). A higher risk of blood clots, which can cause heart attacks and strokes, has been associated with the use of supplementary estrogen in hormone replacement treatment [4]. Before beginning any form of contraceptive medication, medical professionals must assess each woman's risk factors, particularly those that are connected to cardiovascular health. Despite the fact that pre-menopausal women have a considerably reduced risk of cardiovascular disease, periodic follow-up and screening for any issues are crucial [4]. Consequently, since 2000, mortality rates for women between the ages of 35 and 44 have climbed, whereas they have decreased for all other age groups. Increases in obesity and smoking, a loss in physical activity at this stage of life, and a considerable increase in the use of oral contraceptives are among variables that may be causing the surge [5]. Women who smoke and those with high cardiovascular risk should think about other methods of birth control [4]. Any woman thinking about using contraceptives should have her blood pressure, cholesterol, smoking, diabetes, renal issues, obesity, and other vascular illnesses assessed [4]. The study's objective was to evaluate pre-menopausal women's heart disease risk in connection to oral contraceptive tablets.

METHODOLOGY

A comparative observational study was conducted at the department of cardiology, Prime Medical College Hospital, Rangpur, Bangladesh during the period of January 2020 to December 2020. A total of 140 participants were included for the study. A total of 140 participants were included for the study. Among them 70 women with HD (Heart Disease) were Group I and 70 women without HD (Heart Disease) were Group II. Heart disease was diagnosed by specialist cardiology physician according to the European Society of Cardiology (ESC). Respectively woman was assessed exclusively using a case sheet that include age, full medical history, past medical history (mainly hypertension), family history, smoking history & the use of oral contraceptive pill (OCP) and duration of use. Complete physical examination and full investigations were done which include Electrocardiography (ECG). Blood Pressure measurement was done by mercurial sphygmomanometer recording. Statistical analyses were done by using SPSS 19.0 for windows Inc. The data were showed as means ± SD or as numbers & percentages. *P*-values of < 0.05 were considered statistically significant.

RESULTS

Mean age was 45.97 ±0.46 women with HD and 44.83 ±0.57 was women without HD. Women with HD age range 40-45 were 2.8% (2), age range 45-50 were 14.2% (10) and age range 50-55 were 82.9% (58). Women without HD age range 40-45 were 2.8% (2), age range 45-50 were 15.7% (11) and age range 50-55 were 81.4%(57) (Table I). Overweight & Obese 66(94.3%) were women with HD and 50(71.4%) were women without HD. Dyslipidemia 69(98.6%) were women with HD and 16(22.9%) were women without HD. Hypertension 65(92.8%) were women with HD and 16(22.9%) were women without HD. Smoking 16(22.9%) were women with HD and 4(5.7%) were women without HD. Family history of HD 60(85.7%) were women with HD and 18(25.7%) were women without HD. Use of OCP 61(87.1%)was higher among women with HD as compared with those without HD 29(41.4%). Duration of OCP was longer in women with HD than women without HD. P value was < 0.0001 (Table II). The effect of OCP use in women with obesity 45 (68.1%) were women with HD and 21 (31.8%) were women without HD (Table III). The effect of OCP use in women with Dyslipidemia 45 (68.1%) were women with HD and 9(25.0%)were women without HD (Table IV). The effect of OCP use in women with Hypertension 40(61.33%) were women with HD and 6 (37.50%) were women without HD (Table V). The effect of OCP use in women with Smoking 10 (68.42%)were women with HD and 1 (25%)were women without HD (Table VI). The effect of OCP use in women with Family history 34 (57.14%) were women with HD and 6 (33.33%) were women without HD (Table VII).

Table I: Age distribution of the study participants (n=140)

Variable	Women with HD (N=70)	Women without HD (N=70)
40-45	2(2.8%)	2(2.8%)
45-50	10(14.2%)	11(15.7%)
50-55	58(82.9%)	57(81.4%)
Mean ±SD	45.97 ±SD 44.83 ±SD	

Table II: Women characteristics of the two groups (n=140)

Women Characteristics	Women with HD (N=70)	Women without HD (N=70)	*P* value
Overweight & Obese	66(94.3%)	50(71.4%)	< 0.0001*
Dyslipidemia	69(98.6%)	37(52.9%)	< 0.0001*
Hypertension	65(92.8%)	16(22.9%)	< 0.0001*
Smoking	16(22.9%)	4(5.7%)	0.0123*
Family history of HD	60(85.7%)	18(25.7%)	< 0.0001*
Use of OCP	61(87.1%)	29(41.4%)	< 0.0001*
Duration of OCP (yr)	3.13±0.41	1.78±0.19	< 0.0001*

Table III: Effect of OCP use among women with obesity and overweight (n=116)

Groups of overweight & obese women	Use of OCP		Total
	Yes	No	
Women with HD	45 (68.1%)	21 (31.8%)	66(56.9%)
Women without HD	21 (42.0%)	29(58.0%)	50 (43.1%)
Total	65 (57.7%)	51 (42.3%)	116(100%)

Table IV: effect of OCP use among women with dyslipidemia (n=106)

Groups of women with Dyslipidemia	Use of OCP		Total
	Yes	No	
Women with HD	39(56%)	30(44.1%)	69 (65.0%)
Women without HD	9(25.0%)	28(75.0%)	37 (34.9%)
Total	48(50.0%)	58(50.0%)	106 (100%)

Table V: Women with Hypertension the effects of OCP use (n=81)

Groups of HT women	Use of OCP		Total
	Yes	No	
Women with HD	40(61.33%)	25 (38.67%)	65 (80.2%)
Women without HD	6 (37.50%)	10 (62.50%)	16 (19.8%)
Total	46(57.0 %)	35 (43.2%)	81 (100%)

Table VI: Women with Smoking the effects of OCP use (n=20)

Groups of Smoker women	Use of OCP		Total
	Yes	No	
Women with HD	10 (68.42%)	6 (31.58%)	16(55.6%)
Women without HD	1 (25%)	3 (75%)	4 (44.4%)
Total	11 (60%)	9 (48%)	20 (100%)

Table VII: Women with Family history of HD the effects of OCP use (n=78)

Groups of women with Family History of HD	Use of OCP		Total
	Yes	No	
Women with HD	34 (57.14%)	26(42.86%)	60 (77.0%)
Women without HD	6 (33.33%)	12 (66.67%)	18 (23.0%)
Total	40 (51.3%)	38 (48.7%)	78 (100%0)

DISCUSSION

The average age of menopause is 48-52 years, but for some women it may occur as early as 40 or as late as 55 years [6]. In our study overweight & obese were 66(94.3%) women with HD and 50(71.4%) were women without HD. Dyslipidemia 69(98.6%) were women with HD and 16(22.9%) were women without HD. Hypertension 65(92.8%)were women with HD and 16(22.9%) were women without HD. Smoking 16(22.9%) were women with HD and 4(5.7%) were women without HD. Family history of HD 60(85.7%) were women with HD and 18(25.7%) were women without HD. Use of OCP 61(87.1%)was higher among women with HD as compared with those without HD 29(41.4%). Duration of OCP was significantly longer in women with HD than women without HD. There are many prejudicing risk factors for induction of HD including a family history of HD [7], prolong stress and other psychiatric disorder [8], smoking [9, 10], obesity, dyslipidemia [10, 11], hypertension [10-12], diabetes [11, 13], and infections with certain microorganisms [7-14]. It is usually rare to occur in women during the premenopausal age unless there are some predisposing risk factors especially diabetes that may lead to coronary artery disease [10, 11]. In the present study, effect of OCP use in women with obesity were 45

(68.1%) women with HD and 21 (42.0%) were women without HD. Bastien *et al*., showed that obesity is strongly related to other risk factors of HD such as hypertension, hypercholesterolemia and insulin resistance and it is a modifiable risk factor of HD [15]. However, obesity is associated with the use of OCP, as what was recognized by Mohammad NS, *et al.*, that the BMI in women using OCP was found to be significantly high when compared with control of their respective age groups [16]. In our study, effect of OCP use in women with Dyslipidemia showed that 39/48 were women with HD and 30/58 were women without HD. Wells BG *et al*., was stated that women with controlled dyslipidemia can use low-dose OCP, with periodic monitoring of fasting lipid profiles, and women with uncontrolled dyslipidemia or with additional risk factors should use an alternative method of contraception [17]. Skouby S *et al*., mentioned that OCP even in low dose causes decrease HDL and increase LDL, VLDL, and triglyceride [18]. In this study, effect of OCP use in women with Hypertension showed 40/46 were women with HD and 25/35 were women without HD. Mohammad NS *et al*., and Wells BG *et al*., showed that oral contraceptives may lead to raise blood pressure and increase the risk of hypertension which in turn can result in HD.[16],[17] In our study, effect of OCP use in women with Smoking revealed 10/11 were women with HD and 6/9 were women without HD. Zahidullah M *et al*., was proved that smoking acts synergistically with other risk factors to induce HD [19]. So, the World Health Organization (WHO) has publicized that smoking acts as risk factor and enhance cardiovascular effect of OCP, and smokers over 35 years old should not use estrogen- containing contraceptives [20]. In this present study, effect of OCP use in women with Family history showed 34/40 were women with HD and 26/38 were women without HD. Lloyd-Jones DM *et al*., showed women who had family history of cardiovascular diseases may possess an increased risk of early occurrence of HD [21].

Limitations of the study

Sample size was small. The study was conducted in a single center which doesn't reflect the original scenario of Bangladesh. So here need a large multi scale, multi center countrywide study for genuine outcome.

CONCLUSION

This study has confirmed the above-mentioned findings in which the use of OCP increase the risk of HD in premenopausal women specifically in those who already have risk factors of HD. The risk of heart disease was increased among women who used oral contraceptives. Cardiovascular events can be abridged by the management of risk factors. Mainly significant is the control of hypertension, lipids, and other factors contributing to the metabolic syndrome.

RECOMMENDATIONS

We should be careful about this since managing premenopausal women is not only the gynecologist's job. Gynecologists should use an interdisciplinary approach to evaluate patients' vasomotor and urogenital symptoms as well as their cardiovascular risk. Cardiovascular doctors should assist in the harmful treatment of women who are at higher risk of cardiovascular disease.

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